Cystopteris tennesseensis in Illinois

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Cystopteris tennesseensis Shaver is a fertile allotetraploid that presumably arose from an ancient cross involving *C. bulbifera* (L.) Bernh. and *C. protrusa* (Weath.) Blasdell. Shaver (1950) pointed out that *C. tennesseensis* is morphologically intermediate between *C. bulbifera* and *C. protrusa* and concluded that these were the two parental species. Morphological and cytological work by Blasdell (1963) supports this interpretation. Plants of *C. tennesseensis* are usually misidentified as either *C. bulbifera* or *C. protrusa*. As a result, the range and abundance of this fern are not precisely known. This paper presents the distribution of *C. tennesseensis* in Illinois and shows that it is much more common and widespread than generally realized.

Specimens of all Illinois *Cystopteris* from the following herbaria were examined: EIU, ILL, ILLS, ISM, MO, and SIU. Those specimens found to be *C. tennesseensis* were annotated as such and recorded. Locality data of individual collections are available from the author. In addition, numerous areas of suitable rock habitats were visited in the field, especially in southern Illinois and along the lower Mississippi and Illinois rivers.

Previously, this fern was reported from only three Illinois counties: Champaign, Jackson, and Will (McGregor, 1950; Mohlenbrock & Ladd, 1978); however, I was unable to locate specimens from Champaign County. *Cystopteris tennesseensis* occurs most frequently along major watercourses of the state, such as the Illinois, Mississippi, and Wabash rivers (*Fig. 1*). Along these major rivers, habitat for this fern is provided by the rocky escarpments and ravines that run along or into the river floodplains. The writer's field experience in these areas indicate that *C. tennesseensis* is commonly present in suitable habitats and is often abundant where found. *Cystopteris tennesseensis* is also present, although to a more limited extent, in the Driftless Area of northwestern Illinois and in the Shawnee Hills of southern Illinois.

In Illinois, *C. tennesseensis* grows on both limestone and sandstone; however, the great majority of specimens were collected from limestone, indicating a preference for calcareous habitats. Limestone outcrops in Illinois primarily occur along the Mississippi River, the lower Illinois River, and in portions of the Driftless Area in the northwestern corner of Illinois. Major sandstone outcrops where this fern occurs are the Shawnee Hills of southern Illinois and in north-central Illinois at Starved Rock State Park along the Illinois River. Observations in Illinois by the writer support the observations of McGregor (in Wagner & Hagenah, 1956, p. 144) that *C. tennesseensis* produces bulblets much more abundantly on limestone than on sandstone. Furthermore, the Illinois populations of this fern on limestone are more extensive and contain a higher density of individuals compared to sandstone populations where similar amounts of rock habitat exist. The preference of this fern for limestone as opposed to sandstone has been noted in other states (Cranfill, 1980; Shaver, 1950, 1954).

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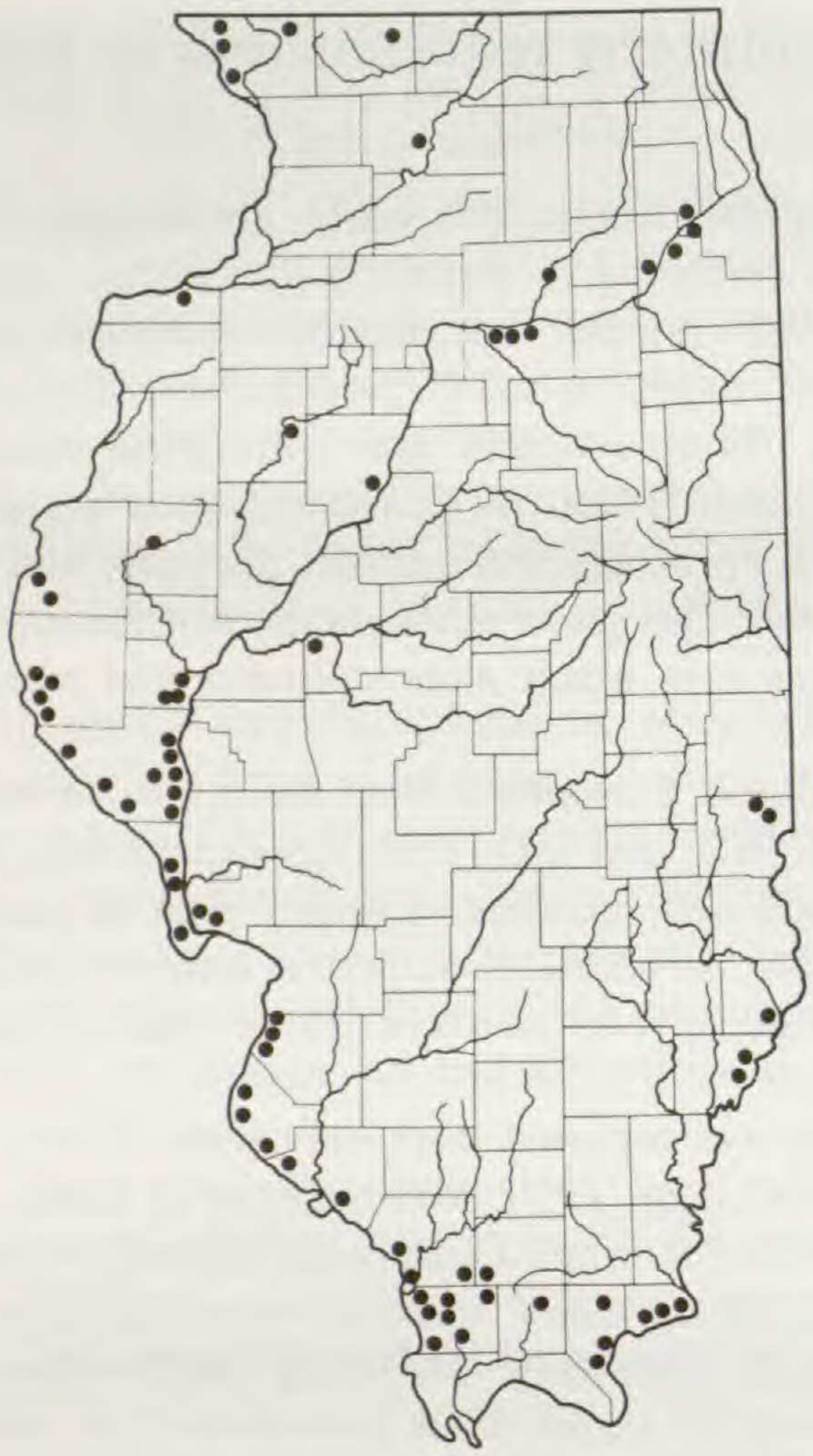

FIG. 1. The distribution of *Cystopteris tennesseensis* in Illinois.

All 90 herbarium specimens of *C. tennesseensis* examined for this study were originally misidentified. This is primarily due to the fact that *C. tennesseensis* is not keyed to in many commonly used floristic manuals and, in part, because the fronds are highly variable and confusingly intermediate between those of its parents. The qualitative characteristics of frond dissection are difficult to describe and to be appreciated by botanists unfamiliar with this fern. However, there is one quantitative character that can be used to distinguish this fern from both *C. bulbifera* and *C. protrusa:* spore size. In the genus *Cystopteris* polyploidy is correlated with spore size. Thus, *C. bulbifera* and *C. protrusa,* both diploids, have spores that are generally 27–32 μm in length, whereas *C. tennesseenis,* a tetraploid, has spores that are generally 32–42 μm in length (Blasdell, 1963). The writer has found spore size to be a reliable character and recommends its use if one is uncertain about identification based on frond morphology alone. Further discussion concerning the identification of this fern can be found in Cranfill (1980) and Shaver (1950, 1954).

Cystopteris tennesseensis is probably more common in many states than is generally realized. A careful search of other herbaria would add greatly to our knowledge of the frequency and occurrence of this fern elsewhere in its range.

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Dieter E. Meyer was born in Görlitz on 21 July 1926, son of Erich and Elisabeth Meyer. His primary and secondary schooling took place in Görlitz prior to and during World War II, and his early interest in natural history led to a volunteer position with a local natural history society. From 1946 to 1950 he studied botany, especially of the cryptogams, in Jena. In 1952 he earned a doctorate from the Free University of Berlin with a thesis on hybridization in *Asplenium*, which became a life-long interest. In 1954 he joined the staff of the Botanical Garden and Museum in Berlin-Dahlem; he was appointed a Keeper in 1964 and a Supervisory Keeper in 1969. His taxonomic interest in ferns was whetted by the excellent living and herbarium collections at Berlin. He himself made collections in Germany, Austria, Switzerland, England, and Canada, often searching for specimens of rare *Asplenium* hybrids that could be brought into cultivation for further study. He reorganized and restored the fern collections at Berlin, which had lain nearly untouched after Hieronymus' death and which fortunately had escaped destruction during World War II. In addition to his broadly based researches on *Asplenium*, Meyer published a variety of biographical, bibliographical, and floristic papers. Music was among his extra-botanical interests. A full biography and bibliography is to be published in Willdenowia, from which most of the foregoing comments have been taken.—*D.B.L.*